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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/930,937	08/16/2001	Vinodha Ramasamy	10012808-1	2242

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EXAMINER

NAHAR, QAMRUN

ART UNIT	PAPER NUMBER
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2124

DATE MAILED: 07/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/930,937

Applicant(s)

RAMASAMY ET AL.

Examiner

Qamrun Nahar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-14 have been examined.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 4-7 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 4 and 7 recite the limitation "further comprising replacing instructions at entry points of the *instrumented* versions of the RP-sensitive functions with branch instructions targeting corresponding instrumented versions of the RP-sensitive functions" on lines 3-5 of the claims. However, this limitation contradicts the specification and drawings of the instant application, see pg. 8, line 25 to pg. 9, line 2; and see Figure 3, step 254; where the instruction at the entry point of the *un-instrumented* version is replaced with a branch instruction having a target that references the instrumented version of the function in the shared memory space.

Therefore, this limitation is interpreted as "further comprising replacing instructions at entry points of the *original* versions of the RP-sensitive functions with branch instructions targeting corresponding instrumented versions of the RP-sensitive functions".

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Claims 5-6 are rejected for dependency upon rejected base claim 4.

4. Claims 4-7 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 4 and 7 recite the limitation "further comprising replacing instructions at entry points of the *instrumented* versions of the RP-sensitive functions with branch instructions targeting corresponding instrumented versions of the RP-sensitive functions" on lines 3-5 of the claims. However, this limitation contradicts the specification and drawings of the instant application, see pg. 8, line 25 to pg. 9, line 2; and see Figure 3, step 254; where the instruction at the entry point of the *un-instrumented* version is replaced with a branch instruction having a target that references the instrumented version of the function in the shared memory space.

Therefore, this limitation is interpreted as "further comprising replacing instructions at entry points of the *original* versions of the RP-sensitive functions with branch instructions targeting corresponding instrumented versions of the RP-sensitive functions".

Claims 5-6 are rejected for dependency upon rejected base claim 4.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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6. Claims 4-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 7 recite the limitation "further comprising replacing instructions at entry points of the *instrumented* versions of the RP-sensitive functions with branch instructions targeting corresponding instrumented versions of the RP-sensitive functions" on lines 3-5 of the claims. However, this limitation contradicts the specification and drawings of the instant application, see pg. 8, line 25 to pg. 9, line 2; and see Figure 3, step 254; where the instruction at the entry point of the *un-instrumented* version is replaced with a branch instruction having a target that references the instrumented version of the function in the shared memory space.

Therefore, this limitation is indefinite and is interpreted as "further comprising replacing instructions at entry points of the *original* versions of the RP-sensitive functions with branch instructions targeting corresponding instrumented versions of the RP-sensitive functions".

Claims 5-6 are rejected for dependency upon rejected base claim 4.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shaughnessy (U.S. 6,026,235) in view of Shaylor (U.S. 6,760,907).

Per Claim 1:

Shaughnessy teaches a computer-implemented method for instrumentation of selected functions in an executable program, the selected functions initially occupying an original address space of the executable program ("A development system having a monitor/profiler or analysis tool for monitoring functions in natively compiled software programs is described. ... The tool employs debugging info in the executable to provide full analysis of an application's functions calls." in column 3, lines 57-67 to column 4, lines 1-4), comprising: generating instrumented versions of selected functions in relocation address space during program execution ("The system of the present invention intercepts all calls to a function by: 1) building a stub table that has a stub for each function, 2) scanning all of the addresses in the relocation tables of the executable image, and 3) disassembling all the code of the executable searching for relative call instructions. The stub serves as a destination for invoked functions. Specially, all references to a particular function are modified to call the stub instead of directly calling the associated function. The stub, in turn, calls an entry point into a monitoring tool and then jumps to the real code of the function being monitored." in column 9, lines 27-29 to column 10, lines 1-8); when a function is called by an instrumented version of a selected function within the relocation address space resulting in a first return-pointer value in the relocation address space, identifying a location in the original address space corresponding to the first return-pointer value as an original return-pointer value,

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associating the first return-pointer value with the original return-pointer value, substituting references to the original return-pointer value for references to the first return-pointer value; upon return of control at the original return-pointer value, obtaining the first return-pointer value associated with the original return-pointer value, and transferring control to an instruction at the address referenced by the first return-pointer value ("The system scans the relocation table to find addresses to functions. For each address in the relocation table, a binary search is performed on the table of known functions ... to see if this is a function address that should be patched to call the stub. All of the executable's code is scanned for relative call instructions using high speed code disassembler. If a relative call is found, the microprocessor instructions defining the call are also patched to call the stub." in column 10, lines 8-16 and column 11, lines 31-46).

Shaughnessy does not explicitly teach replacing an instruction at the address indicated by the original return-pointer value with a breakpoint; and when the breakpoint is encountered upon return of control at the original return-pointer value, obtaining the first return-pointer value associated with the original return-pointer value, and transferring control to an instruction at the address referenced by the first return-pointer value.

Shaylor teaches replacing an instruction at the address indicated by the original return-pointer value with a breakpoint; and when the breakpoint is encountered upon return of control at the original return-pointer value, obtaining the first return-pointer value associated with the original return-pointer value, and transferring control to an instruction at the address referenced by the first return-pointer value (column 9, lines 1-29).

It would have been obvious to one having ordinary skill in the computer art at the time of the invention was made to modify the method disclosed by Shaughnessy to include replacing an instruction at the address indicated by the original return-pointer value with a breakpoint; and when the breakpoint is encountered upon return of control at the original return-pointer value, obtaining the first return-pointer value associated with the original return-pointer value, and transferring control to an instruction at the address referenced by the first return-pointer value using the teaching of Shaylor. The modification would be obvious because one of ordinary skill in the art would be motivated to optimize execution of programs.

Per Claim 2:

The rejection of claim 1 is incorporated, and Shaughnessy further teaches identifying RP-sensitive functions as the selected functions, wherein RP-sensitive functions are those functions that require a return pointer value in the original address space of the executable program (column 12, lines 52-62).

Per Claim 3:

The rejection of claim 2 is incorporated, and Shaylor further teaches further comprising: patching entry points of the RP-sensitive functions with RP-entry breakpoints; and generating an instrumented version of an RP-sensitive function upon encountering the RP-entry breakpoint at the entry point of the RP-sensitive function (column 9, lines 1-29).

Per Claim 4 (as best understood):

The rejection of claim 3 is incorporated, and Shaughnessy further teaches wherein each instrumented version of an RP-sensitive function has a corresponding original version function in the original address space, further comprising replacing instructions at entry points of the original versions of the RP-sensitive functions with branch instructions targeting corresponding instrumented versions of the RP-sensitive functions (column 11, lines 31-46).

Per Claim 5 (as best understood):

The rejection of claim 4 is incorporated, and Shaughnessy further teaches identifying the RP-sensitive functions through analysis of code segments within the executable program (column 3, lines 57-67 to column 4, lines 1-4).

Per Claim 6 (as best understood):

The rejection of claim 4 is incorporated, and Shaughnessy further teaches identifying the RP-sensitive functions through an input list of identifier codes associated with RP-sensitive functions (column 4, lines 18-20).

Per Claims 7 (as best understood) & 8-9:

These are another versions of the claimed method discussed above (claims 4-6, respectively), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also obvious.

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Per Claim 10:

This is another version of the claimed method discussed above (claims 3 and 4), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Per Claim 11:

This is another version of the claimed method discussed above (claims 1, 2 and 10), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Per Claims 12-13:

These are another versions of the claimed method discussed above (claims 5-6, respectively), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also obvious.

Per Claim 14:

This is an apparatus version of the claimed method discussed above, claim 1, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Conclusion

9. Any inquiry concerning this communication from the examiner should be directed to Qamrun Nahar whose telephone number is (703) 305-7699. The examiner can

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normally be reached on Mondays through Thursdays from 9:00 AM to 6:30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki, can be reached on (703) 305-9662. The fax phone number for the organization where this application or processing is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

QN
July 10, 2004

Kakali Chaki

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